



## PATENT SPECIFICATION

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### COMPLETE SPECIFICATION.

#### Improvements in Spring Hinges.

I, EMIL BOMMER, a citizen of the United States of America, of 263, Classon Avenue, Brooklyn, County of Kings and State of New York, United States of America, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

10 This invention relates to improvements in spring hinges of the kind in which a sheet metal hinge-plate or web is made integral with a spring-containing barrel in the case of single-acting hinges, and  
15 with two spring-containing barrels in the case of double-acting hinges, said hinge-plate or web together with said barrel or barrels being of the same thickness throughout and made of a single blank,  
20 and the barrel or barrels being formed by coiling a marginal portion or portions of the blank.

This invention consists in providing on such hinges a strengthening rib between  
25 the web and barrel, the rib extending along the entire length of the web and being formed by applying a compacting pressure to compress the material and produce an indented crimp or groove and a  
30 consolidation of the molecules below the crimp along the centre length of the web adjacent the barrel. A hinge having such a strengthening rib requires no exterior strengthening means.

35 I am aware that it has been previously proposed in hinges having bent-over portions of the hinge-plate encircling a pivot pin to provide adjacent the length of the hinge, for the purpose of locking the free  
40 end of a bent-over portion against opening out or straightening, a V-shaped ridge across the plate, the ridge being formed by a pressing operation adjacent to the bent-over end.

45 In the drawing, wherein I have illustrated several desirable and satisfactory embodiments of the invention and in which similar reference characters

designate corresponding parts throughout the several views:— 50

Fig. 1 is a perspective view showing a piece of single thickness stock operated upon initially and showing the first step in the improved method.

Fig. 2 is an edge view showing the 55 subsequent condition of the stock after undergoing a second step;

Fig. 3 is also an edge view showing the completed hinge part, consisting in this embodiment of one web and two 60 barrels;

Fig. 4 is a front view showing a complete double-acting hinge as constructed according to the present invention with the open position of the movable leaves 65 dotted in;

Fig. 5 is a top plan view of the same;

Fig. 6 is an edge view of a different blank used to form the hinge member 70 shown in Fig. 8;

Fig. 7 is an edge view showing the subsequent condition of the stock shown in Fig. 6 after undergoing a second step;

Fig. 8 is a top edge of a hinge-plate or 75 web and two barrels with the plate or web in a substantially central relation to the axes of the barrels.

Fig. 9 is a side view of a single barrel hinge constructed according to the pre- 80 sent invention.

Fig. 10 is a top plan view thereof, Fig. 9 and Fig. 10 being of a construction like Fig. 3, being practically one half of 85 Fig. 3.

Fig. 11 is a top edge view of a hinge-plate or web with the plate or web or leaf in a central relation to the axis of the barrel as is intended to be used in one embodiment of a single-barrel hinge con- 90 struction, this top edge view being practically one half of Fig. 8; and

Fig. 12 shows the compression of the material.

Referring for the present to Figs. 1, 2 95 and 3, the construction shown therein

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shows the production of the hinge-plate or web and barrels of a double barrel spring hinge from a blank of steel or stock material to a hinge construction consisting of a web or plate and two barrels.

The lateral wings 2 and 3 are separated from the web or hinge plate member 1 by crimps or grooves 4 and 5 made by indenting the metal in one direction out of the plane of the web or hinge member 1, so as to throw these wings into a relatively off-set position as respects the part 1, so that in the completed construction, as shown in Fig. 3, the barrels are off-set in respect to the plane coincident with the web or hinge-plate 1. That is, the plane passing through the plane of the web is off-set at one side of the barrels.

The crimpings may be produced in any suitable manner, as by rolling or stamping. The crimpings 4 and 5, furthermore, serve to form, in known manner, abutments 4' and 5' to support the free edges 6 and 7 of the barrels. The blank is also suitably operated upon either prior to the crimping or after this has been accomplished, to curl or bend the ends 6 and 7 thereof, and as shown in Fig. 2, the wings are later turned at substantially right angles to the plane of the web or hinge-plate 1 in the act of closing the wings by forming or rolling or otherwise forcing them into the cylinders or barrels shown in Fig. 3.

It will be noted that the completed hinge-plate or web 1, with its barrels, as shown in Fig. 3, is so constructed that the free edge portions of the blank lie or abut at or near the crimps 4 and 5 or adjoining the faces thereof in the closed position of the barrels, it being remembered that the stock material of which the device is made is of sufficient thickness and strength to permit of leaving the free edge portion abutting on said crimps without further reinforcement or connecting means, and it will be further noted that no part of the device as completed overlaps and that particularly the web 1 or hinge-plate and barrel or barrels is of a single thickness without joints of any kind and without the need of fastenings to secure any parts together, which fastenings are found to weaken the material of the hinge-plate or web. This construction provides at 40, Fig. 3, a recess for the tit of a washer, when one is used, the washer being thereby prevented from turning.

In Figs. 4 and 5 there is to be found illustrated a completed double barrel hinge in which crimps are provided at 5 and 5' and in which 8 and 9 represent the leaves, the leaf 9 being provided with end flanges 10 adapted to embrace the web or

hinge-plate 1 and the opposite leaf 8 and to fit within a mortise, for instance in a door, if desired.

The leaf 9 is provided with ears 11 which embrace and close the ends of the barrel 2, which latter contains a spring according to a usual construction and a pintle extending through the barrel and the ears and spring holders and washer and having the cap-nuts 12 fitted on the pintle, all as well-known. The other leaf 8 carries ears 13 extending upon the ends of the other barrel 3 which contains in like manner a coil spring, spring holders, and washer and pintle with the cap-nuts 14 at the ends of the pintle, all as well-known. The improved construction of web and barrel or barrels provides at 40 a recess for the tit of a washer when a washer is used, to prevent the washer from rotating.

In Figs. 6, 7 and 8 is shown a double barrel hinge construction in which crimps are provided at 4 and 5 and in which one surface of the hinge-plate or web 1 is arranged substantially in line with the axes of the barrels, so that parts of the barrels are off-set substantially equally at either side of the central plane passing through the hinge-plate or web and the axes of the barrels, as shown in Fig. 8. In Fig. 8 the recess 40 is provided for engagement by a tit of a washer.

In Figs. 9, 10 and 11, the invention is shown applied to a single barrel hinge. In this instance, the hinge-plate or web or leaf 15 corresponds to the web or hinge-plate 1 of the double-barrel hinge shown in Figs. 3 and 8, being practically half the double barrel construction shown in Figs. 3 and 8. The metal is of a comparatively thick gauge and is crimped, as indicated at 4, according to the invention, the barrel 17 being formed off-set from the plane of the hinge-plate 15 with its free end 17' terminating and abutting in known manner against the part 16, as shown in Figs. 10 and 11.

The hinge-plate or leaf 15 is shown as provided with end flanges 18 to take into a mortise or recess, or any part to which the hinge is fitted, and the leaf is combined structurally with a companion leaf 19 having ears 20 at opposite ends of the barrel 17. Suitable screw openings 41 are provided in leaf 19, and may also be provided in leaf 15.

The barrel houses the usual pintle and spring and spring holders, and the ends of the pintles are provided with cap-nuts 21 to secure the pintle in place, all as well-known.

In the single barrel construction shown in Fig. 11, the barrel has its parts off-set equally at either side of the plane

passing in line with the inner face of the web or hinge-plate or leaf and the axis of the barrel, being practically one-half of the double acting hinge of Fig. 8.

5 It will be noted that in Figs. 1 and 2 the blank there shown has between the portions 2 and 1, and portions 3 and 1, crimps or corrugations 4 and 5. What will now be said in respect to crimp 4  
10 applies equally to crimp 5. It will be noted that commencing at about 20 the metal bends to the point 4 which along the length or height of the barrel is provided with a compression of the material  
15 brought about by the action of dies. The compressed part is located at 24 in Fig. 2. From the point 4 the metal bends outward towards the point approximately shown at 21. On the other face of the  
20 blank the metal bends from the point 25 to the peak point 4' and then back to the approximate point 22. Similarly in Fig. 3, the metal bends from point 20 to the point 4, having a compression of the  
25 material at 24 and then bends again to point 21, and on the other side, from 25 with its crimp, to 26, and to 22. It will be noted that the peak 26 forms an abutment along the length of the free end of  
30 the blank which completes the barrel 2. Opposite to this free end is the crimp 4. This crimp or indentation having the compression 24 in the sheet metal material, strengthens the resisting action  
35 of the web. The indentation 4 and compressed part 24 acts as a strengthening rib to the web.

In Figs. 6, 7 and 8, the strengthening rib or indentation is at 4 with a compressed part 34 and the bending begins at  
40 31 and extends to 33 at one side of the blank, and the bending begins at 30 and extends to 32 at the other side of the blank. The free end 38 of the blank

completing the barrel is opposite to the 45 indentation or crimp or strengthening rib 34 and the bend 30 to 32 acts as an abutment to the free end 38 of the barrel. Similarly with Fig. 11, in which  
50 these ideas are embodied in a single acting hinge, the compressed part 34 serves to add great strength at a very vital point.

In accordance with the general principle underlying my invention, a 55 strengthening compression 24 or 34 is provided in the several embodiments illustrated to take up stresses to which the hinge may be subjected, as this compression strengthens the parts at a very  
60 vital point.

The new method consists, as will be seen, in operating upon a single relatively short thick piece of material of substantially uniform thickness to produce a 65 crimp therein to separate the hinge plate portion from the barrel portion.

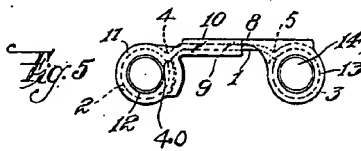
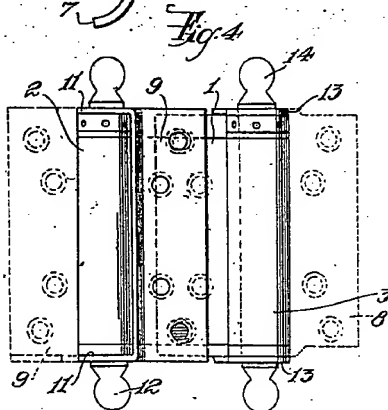
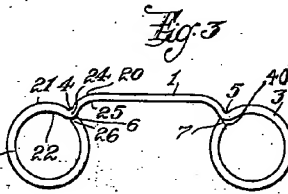
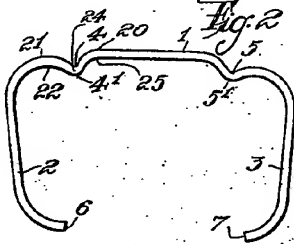
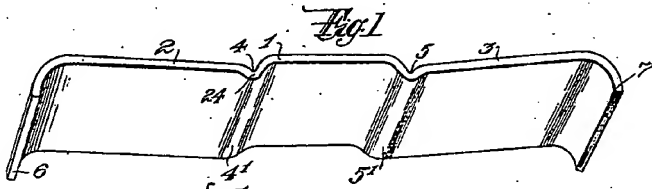
Having now particularly described and ascertained the nature of my said invention and in what manner the same is  
70 to be performed, I declare that what I claim is:—

In a spring hinge of the kind referred to, a strengthening rib between the web and barrel, the rib extending along the 75 entire length of the web and being formed by applying a compacting pressure to compress the material and produce an indented crimp or groove and a consolidation of the molecules below the crimp  
80 along the entire length of the web adjacent the barrel.

Dated this 28th day of February, 1923.

ABEL & IMRAY,  
Agents for the Applicant, 85  
30, Southampton Buildings, London,  
W.C. 2.

[This Drawing is a reproduction of the Original on a reduced scale.]



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